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Towards molecular traceability of ‘Tinca Gobba Dorata del Pianalto di Poirino’

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The ‘Tinca Gobba Dorata del Pianalto di Poirino’ (Golden humped tench of Poirino highland, PO), has long been farmed in Piedmont region, always playing an important role in the local economy. In 2008 the PO tench was registered as PDO product, but an effective system of identification does not exist yet, with the consequent risk of food fraud. Our previous sequencing data on ND1, ND6, cyt *b* and D-loop mtDNA segments in several tench populations (Lo Presti *et al.*, 2014) detected one haplotype (H1e) possibly private of PO. It differed from the RefSeq (NC_008648) for two SNPs, in ND1 (3842 A>G) and ND6 (14210 G>A) segments. Since only one individual from PO was sequenced, the present study was carried out in order to verify in a larger sample whether H1e haplotype is really exclusive of PO population, hence useful in the framework of product traceability.

A total of 276 samples of fin were collected from PO and other 9 populations located in different areas of Italy: North (Iseo and Valagola lakes), Centre (Bolsena, Bracciano and Trasimeno lakes) and Sicily (Alcantara and Prainito rivers, Cesarò and Santa Ninfa lakes). A PCR-RFLP assay was set up to analyse the SNP 3842 A>G as diagnostic for H1e. DNA was amplified using the primers For CGATTCCGATACGACCAACT and Rev TCTACTGCTCGTGGGTGATG, and the amplicons were digested with *SfcI*.

The screening revealed that the H1e haplotype is present in PO with quite a high frequency (0.36) and absent in all the other examined populations. The data on the PO population were also examined separately by pond, showing that H1e was present in all ponds but two, and in some cases it was the predominant one. Therefore, the tench in Poirino highland might derive from a maternal lineage evolved independently from the original strain. These results further support the genetic diversity of PO tench, already demonstrated by the presence of another private haplotype, H2. Moreover, the Median-Joining network of the haplotypes found in Italian populations, constructed on the basis of the restriction sites, highlighted that H1e and H2 are the most divergent ones, confirming that the PO tench highly contributes to the species biodiversity.

In conclusion, the exclusive mutations detected are worthy of note, underlying the genetic originality of PO, but they are only partly useful for traceability. This result suggests the need for further investigations aimed at detecting genetic labels able to univocally discriminate the PO tench.